SAFETY MANAGEMENT PRACTICES AND SAFETY BEHAVIOUR AMONG EMPLOYEES IN STEEL FABRICATION CONSTRUCTION COMPANY

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ABSTRACT

Safety management practices play a vital role in reducing accident in the workplace by improving working conditions and positively influence both employers and employees attitudes and behavior towards safety and health. This study examined the perception of foreign employees in the steel fabrication construction company located in Shah Alam, Selangor on six management practices namely management commitment, safety training, workers' participation, safety communication and feedback, safety rules and procedures and safety promotion policies with safety compliance and safety participation by conducting a survey using questionnaires among 161 employees. The findings of this study revealed that management commitment, safety training, and safety rules and procedures are factors that have significant correlation with safety compliance. Meanwhile, among factors that have significance relationship between safety management practices with safety participation are safety training, safety rules and procedures and safety promotion policies. Safety training, and safety rules and procedures were identified as the safety management practices that supported both safety compliance and safety participation in this study. The findings provide valuable guidance for researchers and practitioners for identifying solutions that can improve safety and health at workplace.

Keywords: Management Commitment, Safety Training, Workers' Participation, Safety Communication and Feedback, Safety Rules and Procedures, Safety Promotion Policies, Safety Compliance and Safety Participation.

ABSTRAK

Amalan pengurusan keselamatan memainkan peranan yang amat penting dalam mengurangkan kadar kemalangan di tempat kerja dengan mempertingkatkan persekitaran kerja dan mempengaruhi kelakuan dan sikap majikan dan pekerja dalam aspek keselamatan dan kesihatan. Kajian ini adalah bertujuan untuk mengkaji persepsi pekerja asing di sebuah kilang pembinaan besi di Shah Alam, Selangor. Dalam kajian ini, enam faktor amalan pengurusan keselamatan seperti komitmen majikan, latihan keselamatan, penglibatan pekerja, komunikasi dan maklumbalas keselamatan, peraturan dan prosedur keselamatan dan polisi promosi dengan kepatuhan keselamatan dan penglibatan keselamatan telah dikaji menggunakan 161 pekerja. Hasil kajian menunjukkan komitmen majikan, latihan keselamatan dan peraturan dan prosedur keselamatan adalah antara faktor yang mempunyai pengaruh yang signifikan dengan kepatuhan keselamatan. Didapati latihan keselamatan, peraturan dan prosedur keselamatan dan polisi promosi keselamatan mempunyai pengaruh yang signifikan dengan penglibatan keselamatan. Hanya latihan keselamatan, dan peraturan dan prosedur keselamatan mempengaruhi kepatuhan keselamatan dan penglibatan keselamatan. Hasil kajian ini boleh dijadikan sebagai panduan kepada pengkaji dan pengamal untuk mencari penyelesaian yang dapat mempertingkatkan mutu keselamatan dan kesihatan di tempat kerja.

Katakunci: Komitmen Majikan, Latihan Keselamatan, Penglibatan Pekerja, Komunikasi dan Maklumbalas Keselamatan, Peraturan dan Prosedur Keselamatan, Polisi Promosi Keselamatan Kepatuhan Keselamatan dan Penglibatan Keselamatan.

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LIST OF ABBREVIATIONS

OSH	Occupational Safety and Health
ILO	International Labour Organization
OSHA 1994	Occupational Safety and Health Act 1994
SOCSO	Social Security Organisation
S.O.P	Safe Operating Procedure
BBS	Behaviour Based Safety
FMA 1967	Factories and Machinery Act 1967
TPB	Theory of Planned Behaviour
PPE	Personal Protective Equipment
HR	Human Resources
ACM	Actively Caring Model
SME	Small Medium Enterprises
NIOSH	National Institute of Occupational Safety and Health
WHO	World Health Organization
SPSS	Statistical Package for The Social Science
JSA	Job Safety Analysis
EFA	Exploratory Factor Analysis

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

Many organisations have begun to focus and include the Occupational Safety and Health (OSH) as one of the determinants for improving productivity and efficiency apart of emphasizing on quality for sustaining continuous existence. Rapid economic growth in Malaysia from industrialisation has given not only significant impact in terms of income distributions and quality of life, but it has also resulted in increasing number of accidents at workplace.

According to the International Labour Organization (ILO), it is estimated that every year about 2 million workers are killed due to work-related accidents and diseases, 270 million occupational accidents and 160 million work-related diseases are occurring (Noor Aina Amirah, Wan Izatul Asma, Mohd Shaladdin Muda & Wan Abd Aziz Wan Mohd Amin, 2013). Occupational safety and health, which is the discipline concerned with preserving and protecting human and facility resources in the workplace, is an important aspect in reducing risk at workplace.

The occupational safety and health in high risk industry such as construction industry is a major concern because of its operations associated with different hazards, weather condition and different jobs during construction (Szer, 2012). Because of these risks and

hazards at workplace, Malaysia government has established Occupational Safety and Health Act (OSHA) 1994 which is a self-regulation for employer, employee and self-employed personnel to be responsible to on their own safety and health at workplace. The introduction to OSHA 1994 has made all industries in Malaysia to identifying hazards, conducting risk assessment and controlling those risks.

In Malaysia, the number of occupational accidents reported to Social Security Organisation (SOCSO) is 55,186 cases for 2009. The industrial accident recorded 34,376 cases while the remaining cases falls under the category of commuting accident (SOCSO, 2009). While in 2010, the number has increased to 57639 cases, with 35,603 of industrial accident cases has been declared (SOCSO, 2010). For subsequent year, the number of workplace accidents cases reported to SOCSO increased by 3.77 % compared to 2010 (SOCSO, 2011). In 2012, the workplace accidents cases increased to 61552 cases with 35296 industrial accident cases (SOCSO, 2012). The figure was increased to 63557 cases in 2013 and industrial accident cases recorded 35898 (SOCSO 2013). Therefore, total number of accident cases contributed by the construction industry from year 2009 till 2013 shown in Table 1.1.

Table 1.1

Accidents Contributed by Construction Industry in Malaysia

Year	Number of accidents by construction industry (cases)
2009	4108
2010	4665
2011	4937
2012	5177
2013	5908

Source: SOCSO Report (2009-2013)

In essence, most organizations are developing methods to increase employee engagement for safety. This study addresses key issues to accomplish the present goal, via improving safety behaviour, sustaining a balance between safety compliance and encouraging safety participation.

1.2 Problem Statement

Study on human safety behaviour as the main predictor of occupational accident started as early as 1940s where Heinrich (1941) concluded that 88% of the industrial accidents are caused by unsafe behaviour whilst. Based on Heinrich Theory, human factor is the important to be investigated because it contributed the most to the occurrence of workplace accidents. Then, Bowander (1987) concluded that workplace accident contributing factors are namely engineering factor, technological factor, system failure factor and also human safety behavioural factor. Whereas, Gyekye (2010) found that safety behaviour of the workers (unsafe act) is the main fundamentals which cause occupational accident besides working environment (unsafe condition). Various efforts have been made by previous researchers to understand and identify problems related to safety behaviour among employees from

different sectors such as construction, oil and gas industry, food industry, manufacturing and so forth (Tucker & Turner, 2011) as it is believed that the identification of the main contributors to safety behaviour could lead to the prevention of industrial accidents.

Workplace accident, injuries, and illnesses have become a major problem in industrialisation world as indicated by Biggs, Sheahan and Dingsdag (2005) and Hamalainen, Takala and Saarela (2012) including Malaysia (Please refer to Table 1). It has become a serious issue in Malaysia as the accident cases in construction industry are increasing from year to year. Industrial accidents bring a lot of impact to the involved organisations. The impact are such as financial lost (cost of machinery repairing, medical expenses, legal fees) and also non-monetary aspects of lost such as decreasing morale of employees as well as company's reputation (Noorul Huda Zakaria, Norudin Mansor & Zalinawati Abdullah, 2012).

While most of the occupational safety behaviour indicators had used workplace injuries as an indicator of safety failures, researchers had investigated more proximal and positive safety-related outcomes, such as the safety related behaviours that precede and may prevent workplace injuries (Turner, Stride, Carter, McCaughey& Carroll, 2012).

Noorul Huda Zakaria et.al. (2012) found that the failure of the workers to work safely according to Standard Operating Procedure (S.O.P) will contribute to workplace accident. In addition, Gyekye (2010) stated that the main two fundamentals which cause occupational accident are the characters of the worker (unsafe act) and the characteristic

of the working environment (unsafe condition). Previous research found that the accident at workplaces can be reduced if employees and employer are more committed in having and maintaining good safety behaviour (Christian et al., 2009). Implicit in the ideas of the aforementioned researchers, is the fundamental involvement of human factors in most safety failures. Herbert W. Heinrich also recognized human error factors in his ten statements as described in the axioms of Industrial Safety, as the highest contributor to work-related accidents (Goetsch, 2008) where he noted that unsafe behaviours by human are the highest consequences to death.

Many researchers have put an effort to combat an issue on occupational accidents where there is a good understanding of the extent and pattern of accidents in the construction industry, however, there is only limited literature about safety behaviour factors contributing to those and relatively a scares in steel fabrication construction company when compared with other industrial sectors in Malaysia (Sathia Segaran, 2012).

Safety compliance and safety participation are two main important criteria of safety behaviour that a worker should have at the workplaces. Safety compliance involves adhering to safety activities that need to be carried out by individuals to maintain workplace safety such as complying with personal protective equipment (Szer, 2012). Meanwhile, safety participation involves helping coworker, promoting the safety programme at the workplace, demonstrating initiative and putting effort into improving safety in the workplace (Szer, 2012).

Therefore, safety behaviour among the employees in steel fabrication construction company must be seriously addressed and promptly monitored in order to increase the occupational safety and health (OSH) level of standard at the workplaces and furthermore to prevent industrial accident from occur and recur.

In association with the safety behaviour, determining antecedents of workplace accidents are crucial. Whilst there are other antecedents which causes workers to indulge in unsafe acts and displaying of unsafe behaviour, safety management practices has remained as a novel intervention owing to the fact that improved safety behaviour among workers in the steel fabrication construction company would result in a positive safety behaviour and improve workers safety participation at their work place (Zohar, 2010). Therefore six dimensions of safety management practices applied in this study could influences safety behaviour (e.g. safety compliance and safety participation) and it has been proven by Vinodkumar and Bhasi (2010). The six dimensions are management commitment, safety training, workers' involvement, safety communication and feedback, safety rules and procedures and safety promotion policies. These dimensions empirically proven to improve the capability of employees to reduce accident and injuries and increase safety performance in the workplace **(**Ali, Abdullah & Subramaniam, 2009; Vinodkumar & Bhasi, 2010; Vredenburgh, 2002).

Theoretically, the relationship between safety management practices and safety behaviour can be explained through theory of Behaviour Based Safety (BBS) by Dan Petersen in 1980's. Theory BBS focuses on human behaviour, analyse why they do it

and then applies a research supported intervention strategies to improve human behaviours. Human, become the main factor contributing to BBS. Human refers to the individuals who have knowledge, experience, ability, motivation and personality. Human factor are influenced by many situation such as safety training received, workload and level of understanding (Geller 1994).

Knowing the importance of safety at workplace, this study is carried out to investigate the influence of safety management practices namely management commitment, safety training, workers' involvement, safety communication and feedback, safety rules and procedures and safety promotion policies with safety behaviour namely safety participation and safety compliance. This enable employer to have a better understanding on the importance of safety behaviour and performance of employee toward safety practices at workplace. Hence, this will enable employers to produce remedies that can be taken to prevent future accident recurrent.

1.3 Research Objectives

This study is carried out to determine whether all the six independent variables of safety management practices can affect the participation and compliance among workers in the steel fabrication construction company.

The study intends:

1.3.1 To determine the level of safety participation and compliance among workers in the steel fabrication construction company.

1.3.2 To examine the relationship between the six independent variables of safety management practices consisting of management commitment, safety training, workers involvement in safety, safety communication and feedback, safety rules and procedures and safety promotion policies with safety compliance and participation among workers in the steel fabrication construction company.

1.4 Research Questions

There were questions raised up to conduct on this study of what all the six independent variables and the determination of safety participation and safety compliance will be measured to gain the appropriate findings and conclusion. This lists of questions mentioned were as follows:

1.4.1 What is the level of safety behaviour among workers in the steel fabrication construction company?

1.4.2 How would safety management practices namely management commitment, safety training, workers involvement, safety communication and feedback, safety rules and procedures and safety promotion policies influence safety behaviour among workers in the steel fabrication construction company?

1.5 Significance of the Study

Significance of this study can be viewed both from theory and practice aspects. Theoretically, most of the previous studies that relates to BBS focused on manufacturing industries. However, there are limited studies which directly emphasize on the

behavioural aspects of the employees in Malaysia specifically in the construction industries. Apart from physical safety, researchers also need to focus on the antecedents of behaviours. Probably the lack of this kind of study was due to our construction industries itself which applied closed door policy for variety reasons compared to western construction industry. Moreover, it is not easy to access a construction site without a proper channels (Lees & Austin, 2010).

In addition, this study also will be performed among employees in steel fabrication construction company in Malaysia which differ from western perspective that mainly focuses on BBS promotion in the construction sites which is considered as a vital factor of health and safety management (Morteza Oostakhan, Amirabbas Mofidi & Amirhosain Davudian Talab, 2012). Possibly there might be significant differences in the findings of present study compared to the study done in western countries (Pakisamy, 2012).

Even though there were studies on BBS in Malaysia but the number is still limited specifically on foreign workers in the construction industry. Therefore, this study will be carried out among foreign workers in the steel fabrication construction company in Malaysia.

In practical perspectives, first, the findings gathered in this study will be useful for industrial practitioners to understand all the influencing factors towards safety behaviour (e.g. safety compliance and safety participation), especially among the employees of steel fabrication construction company in Malaysia. The findings of the present study

also could help steel fabrication construction company to become efficient by reducing unwanted incidents, accidents and fatalities.

The result of this study can be used as guidance for management and further improve safety related issues in steel fabrication construction company. It could be helpful in the development of new policy, more specific training program, awareness workshops, safety campaigns, additional safety procedures or work instructions, new guideline for conducting specific task associated with steel industry and even reward for those who show compliance with safety procedures in the course of related work.

Finally, findings from this study may enable our Malaysia government to recognize safety management practices consisting of management commitment, safety training, workers involvement in safety, safety communication and feedback, safety rules and procedures and safety promotion policies that influences safety compliance and participation among workers in the steel fabrication construction company and make sure construction sectors in Malaysia will continue to progress and indirectly enhance the economy growth in Malaysia.

1.6 Summary

This chapter has focuses on an overall view of the present study. It discussed the importance and the necessity to study safety behaviour (safety compliance and safety participation) in organisations. The chapter also highlighted that safety management

practices which consisting of management commitment, safety training, workers' involvement in safety, safety communication and feedback, safety rules and procedures and safety promotion policies that have been examined as antecedents of safety behaviour, however empirical research on the relationship between these variables with safety compliance and safety participation is limited. To fill in the gap, the present study will examine the relationship between safety management practices with safety compliance and safety participation. The next chapter will provide a review of the main variables that are proposed in the present study.

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter discusses on the overview of relevant legislation enforced on safety and health in Malaysia, the literature on safety behaviour (e.g. safety participation and safety compliance), safety management practices (e.g. management commitment, safety training, workers' involvement, safety communication and feedback, safety rules and procedures and safety promotion policies) and related theories. First, overview of relevant legislation on safety and health namely Occupational Safety and Health Act 1994 (OSHA 1994) and Factories and Machinery Act 1967 (FMA 1967). Second, safety behaviour (e.g. safety participation and safety compliance) will be discussed and followed by its conceptualizations. Third, the review will focus on the antecedents of safety behaviour (e.g. safety participation and safety compliance). Fourth, the main theories such as the antecedent-behaviour–consequence model, Heinrich's Domino Theory and Theory of Planned Behaviour (TPB) will be explained in detail. Finally, this chapter also focuses on the theoretical and empirical support for the hypothesized relationships among the variables.

2.2 An Overview of Relevant Legislation

In Malaysia, occupational safety and health is governed by OSHA 1994. Section 15 of this act has pertinent objective which precisely requires employers to adopt certain practices, means, methods or processes reasonably necessary to protect workers during

work (OSHA 1994). Thus, it is the duty of employers to familiarize themselves with standards applicable to their establishments, to eliminate hazardous conditions to as far as is practicable, and to comply with the regulations and orders required by this act. Employees are expected to reciprocate by complying with the rules and regulations that have been established and enforced by the employers as required by section 24 of the act.

Steel fabrication construction company is also governed by Factories and Machinery Act 1967 under Factories and Machinery (Fencing of Machinery and Safety) Regulations, 1970. In addition, it is mandatory to provide safe work place and ensure that the welfare of the workers is protected regardless of their country of origin Factories and Machinery (Safety, Health and Welfare) Regulations, 1970.

2.3 Safety Behaviour

This chapter will discuss on the definition of safety behaviour and conceptualizations of safety behaviour.

2.3.1 Definition of Safety Behaviour

Behaviour is defined as everything a person does that are observable and measureable (Vijayakumar, 2007). Safety behaviour is defined in terms of safety compliance and safety participation (Neal & Griffin, 2006). Safety behaviour explains the core activities

that need to be carried by employees according to occupational, safety and health requirements to prevent workplace accidents (Mahmood, 2010).

Safety behaviour defines the behaviour that supports safety practices and activities that need to be accepted by employees according to occupational, safety and health requirements to avoid workplace accidents (Zin & Ismail, 2012). Safety behaviour is influenced by activators or antecedents and consequences (Miltenberger, 2012).

The safety behaviour, which is also known as Behavioural Based Safety (BBS) are used to the behavioural approach to improve safety performance at the workplace (Mohd Zakir Ibrahim, 2012). The concept of BBS is to apply the science of behaviour which focuses on human acts, analyses such acts and applies a research supported intervention strategy to improve the acts. BBS approach is to study deeper into the inner core of the individual and understand their personality characteristics, competency level and what motivate them to behave safely. Safety behaviour identifies this gap and its concept is to improve the behaviour by improving the inner-self of the individuals. It is a long term process which involves rigorous effort and commitment from both party employer and employees (Mohd Zakir Ibrahim, 2012).

Evolution of the BBS at workplace was first established in the 1930 after the finding of the accident reports revealed that as many as 95 percent of workplace accident were caused by employee unsafe acts (Geller, 2001; Wikipedia, 2008; Cooper, 2009). Cooper 2009 described at length the reason why people behave unsafely because they had never

been hurt while doing their jobs in unsafe ways. Over the certain period of time, the lack of any injuries of those who have been consistently committing unsafe acts will reinforce the unsafe behaviours. These behaviours may eventually lead them to serious accidents.

Safety behaviour is expressed in term of employee compliance to the organisation safety rules and regulation as well as voluntarily participation in safety programs and initiative (Neal & Griffin, 2006). Safety compliance is directly contributed to personnel safety and represents the core activities that need to be performed to maintain workplace safety. The basic compliance is not only the use of personnel protective equipment (PPE) but compliance with the rules and regulations that have been established and enforced by the employers as required by Section 24 of OSHA 1994. Safety participation described the behaviours that do not directly contribute to employee personal safety but help to create an environment that support safety at workplace.

2.3.2 Conceptualizations of Safety Behaviour

The concept of safety behaviour approached refers to a systematic application of psychological research on human behaviour aimed at changing unsafe to safe behaviour, agreed among researchers (Choudhry et al., 2007). Hence, safety behaviour is an analytical or data-driven approached, where critical behaviour get identified and targeted for change. Further, Cox et al., 2004 highlighted that behaviour based safety interventions are people focused and are often based upon one to one or group observations of employees performing routine works tasks, feedback on safety related

behaviour, coaching and mentoring. In application of safety behaviour is a "bottom-up" approach where the primary attention is directed at specific safety related behaviours that are typically performed by frontline employees. Changes in the frontline safety behaviours will improved safety performance and over time diffused into the organisation to become culture. The mode of safety intervention is effective significantly improving employee safety behaviour (Cox et al., 2004).

2.3.3 Antecedents of Safety Behaviour

This chapter will explain on the antecedents of safety behaviour (e.g. management commitment, safety training, workers involvement, safety communication and feedback, safety rules and procedures and safety promotion policies.

2.3.3.1 Management Commitment

Management commitment is defined as the management's involvement and engagement in actions towards achieving a goal (Cooper, 2006). Management commitment is agreed as the main significant factors by many researchers in occupational literature (Sulastre Mat Zin & Faridah Ismail, 2011). Top management should actively lead the organization and employees towards achievement of organization safety goals by showing that organization is serious about safety. Employer should demonstrate their commitment through strongly realization of safety compliance to safety requirements and ensure that everyone in the organization is certain about their safety and health responsibilities (Fernando et al., 2008). He summarized that manager commitment factors towards realization of safety compliance in workplace can be achieved with constituted joint safety and health committees at site and departmental level, accountability of managers

to the joint safety and health committee, engagement of safety and health representatives with the health and safety practitioners, dialogue among local area and line managers within the establishment of safety and health representatives, the provision time of facility to have the safety and health representative functions such as joint safety and health inspection, investigations of employees complaint, making representations to managers and so on, involvement of safety and health representatives in reporting and monitoring on OSH, access of safety and health representatives to employees and access to have training for safety and health representatives (Walters and Nicholas, 2006). Hence, management commitment towards safety and health at the workplace can change behaviour of their employees (Thye, 2006).

Previous studies had identified the importance of management commitment in reducing employee injuries (Mashi, 2014). Management's commitment to safety is a main factor which leads to the attainment of an organization's safety program (Zohar, 1980). This commitment can be apparent through job training programs, consideration of safety in job design, and management participation in safety committees and review of the pace of work.

2.3.3.2 Safety Training

An organization that wants its employees to be active participants in safety activities should give them proper training. Similarly, safety training can be a means by which accident can be predicted (Mashi, 2014). In addition, providing safety and health training enables workers to know how to work safely and help organization to avoid litigation as a result of an accident. Effective safety training is important to educate

employees on potential of accidents, how to prevent accidents and potential hazards involved in their jobs. Hence, training and education programs play a significant role in enhancement of safety in construction and important to increase safety awareness (Ghani et al., 2010).

Training is an integral part of OSH. To ensure the success of any OSH programme at the workplace, adequate and effective training must be implemented for all those responsible for OSH. Training enables managers, supervisors and workers to understand the workings of safety management systems and the legal compliance required. They will then understand their own responsibilities and the necessary actions to be taken towards upgrading safety and health at their respective workplaces (National Institute of Occupational Safety and Health, 2011). Law, Chan and Pun (2006) defined safety training as the knowledge of safety given to employees in order for them to work safety and with no danger to their wellbeing. While Nor Azimah et al., 2009 considered safety training as attitudes to acquire knowledge and skills about risks in job.

Training isn't just about formal 'classroom' courses. According to Hughes and Ferrett (2007), training is the one of the most important elements of any safety and health programme. Training needs may range from training supervisors especially in their work task, employee updates and new worker orientations. The aspects of training are not limited to but include the safety and health responsibilities of all personnel concerned, regularly and systematically in specific job techniques, new employees are given extensive safety training, immediately after hiring, the dedicated time allocated and its effectiveness.

Training is required on recruitment, at induction or on being exposed to new or increased risks due to being transferred to another job or given a change in responsibilities. It is also due to the introduction of new work equipment or a change of use in existing work equipment and the introduction of new technology (Hughes & Ferrett, 2007). Indeed it also due to the introduction of a new system of work or the revision of an existing system of work and an increase in the employment of more vulnerable workers (your or disable person). Training is also required on recruitment, at induction or on being exposed to new or increased risks due to particular training required by the organization's insurance company such as specific fire and emergency training.

Training is one of the human resources (HR) practices most commonly discussed in the literature as a way to improve workers' safety (Lauver, 2007; Hughes & Ferrett, 2007; DeJoy et al., 2000; Zohar, 2002). Training impacts workers by improving their skills and abilities, as well as by communicating what is important. Training is an 'essential component' because organizations rely on frontline workers skill and initiative to identify and resolve problems and to initiate change in work methods (Pfeffer & Veiga, 1999). Training workers on attitudes, behaviours and beliefs toward safety has been shown effective (DeJoy et al., 2000; Harvey et al., 2001). Training interventions on the supervisor and workers level have been associated with reduced Lost Time Injury (LTI) rates and injury costs (Harshbarger & Rose, 1991), a decrease in minor injury rates, an increase in personal protective equipment (PPE) usage, improved safety climate rating (Zohar, 2002).

2.3.3.3 Workers' Involvement

Worker involvement in safety encompasses the flow of information upward and decision making process within the organization (Mashi, 2014). The main reasons why workers should involve in safety management decision according to European agency for safety and health at work (2012) is that workers participation help in developing ways of protecting workers and help organization to develop measures of preventing occupational accidents in a timely and effective manner.

According to Vredenburgh (2002), employees at workplace are most qualified personals to make suggestion for making improvement and they are reliable to discuss about safety and health issues that affect the workers in the organization. This empowers workers with authority, responsibility and accountability for required decisions and ensures that both employees and managements are involved in setting goals and objectives (Cohen & Cleveland, 1983). Thus, it encourages the employees to grant their best involvement as an individual and team in safety management practices in firm.

2.3.3.4 Safety Communication and Feedback

The poor safety communication will not help the organization to improve safety at workplace (Nur Atiqah Jumain & Haslinda Abdullah, 2014). Communication of various kinds is used to enhance the general effectiveness of any motivational effort. Two-way communication can lead to exchange in behaviour. Regular communication related to safety issues between managements, supervisors and workforce is an effective management practice to improve safety in workplace (Vinodkumar & Bhasi, 2010).

While Nor Azimah et al. (2009) have described safety communication as perception about safety communication including openness in communication.

Safety communication was also included as a factor in their surveys using their questionnaire among various categories of workers and showed that safety performance is influenced by level of communication in an organization (Vinodkumar & Bhasi, 2010). It order to support site safety program, information such as unsafe conditions and new rules and procedures are very important (Andi, 2008).

Communication in the organization included all types of information passing such as meeting, telephone conversation, e-mail, writing memo, information board and face to face communication. There are three basic methods of communication in health and safety. They are verbal, written and graphic. Verbal communication is the most common and it is communication by speech or word of mouth. Written communication takes many forms from the simple memo to the detailed report and the most common way in which written communication is used in the workplace is the notice board. While graphic communication is communication by the use of drawings, photographs or videos and the most common forms used are the poster and the video. In the way to ensure the effectiveness of communication within organization, two mechanisms improve the quality of the communication need to be considered. They are the repetition of the message, which decreases the amount of distortion or variance around the message, and the verification of the content, which reduces the bias in the message (Guetzkow, 1965). This is where the communication leads the organization sharing business important

information as workers need to understand the relationship of environmental health and safety to the actual business operations that they perform (Nielsen, 2000).

2.3.3.5 Safety Rules and Procedures

Vinodkumar & Bhasi (2010) describes the safety rules and procedures that well established and documented by an organization and it enforcement towards safety management practices improves safety behaviour of employees at workplace. Safety rules and procedures related matters such as adequate safety department, regular safety inspection, supervisor enforcing safety rules and effective safety and health rules and procedures in place to prevent accident occurring. Similarly, study by Mearns et al. (2003) found a significant correlation between safety rules and procedures and safety behaviour.

2.3.3.6 Safety Promotion Policies

The organization reward system is the standards, rules and procedures connected with the compensation and allocation of benefits to employees for a job well done and motivation or anything given in recognition of effort or achievements. The reward has a direct impact on desirable behaviour when it increases (Geller & Wiegard, 2005). Many empirical studies have found rewards can enhance work-related outcomes (Khan, 2010 and Oluleye, 2010). Within the context of safety, Eiff (1999) found equitable reward system is necessary to motivate individuals to behave safely.

Hagen (2001) describe safety promotion policies of management such as recreational activities, rewards, and incentives motivate employees to perform safely in workplace. Cohen, (1979) says that safety promotion policies can encourage employees to the hazard control programme of the organization and motivate employee to take self-protection action towards safety management. Vredenburgh, (2002) states that a well-designed reward system should discovered by high level of visibility in the organization and offering recognition that encourages behaviour modifications. Issues related to safety promotion policies such as rewards and incentives, creating awareness among workers, safety week celebration, encourage employee to report safety matters and counting safe conduct are positive factor that contributes to a good safety management practices.

2.3.4 Theories on Safety Behaviour

The theories which are relevant to this research could be elaborated as follows:

2.3.4.1 The Antecedent-Behaviour –Consequence Theory

The antecedent-behaviour-consequence theory of applied behaviour analysis developed by Geller (2001) identified antecedents or activators, direct one's focus and attention on relevant safety behaviours needed for a given task. Effective activators are simple, memorable, and tied closely to consequences. This author further extended the research to introduce the actively caring model which could be adopted as a self-sustaining safety model by industries. This concept has been widely accepted as a behaviourally based safety (BBS) endeavors. Workers who lack safety participation due to either an increase

in work pressure to expedite production or perceived that the safety climate of their work place is poor often would have poor work attitude and safety behaviour. The importance of skills and job expectations had been identified as an important parameter which could influence safety behaviour among workers.

One of the important elements which had been used in this research is the level of safety participation which could be used as an intervention to apprehend unsafe work behaviours and instill good safety behaviour among workers. It has been an established fact that disincentives are often ineffective because they are used inconsistently and encourage avoidance behaviour rather than achievement. In addition, safety-incentive programs based on outcomes can stifle employee safety participation in the development and administration of an effective behaviourally based safety programs.

2.3.4.2 Heinrich's Domino Theory

Heinrich's Domino Theory was developed by H. W. Heinrich during his tenure with Travelers Insurance Company in the 1930's and 1940's. Heinrich conducted research on thousands of insurance and injuries as well as illness reports. These reports blamed human fault for 73% of the accidents. Heinrich concluded that 88% of industrial accidents are caused by negligence of workers. Heinrich further refined his research and discovered that the antecedents of injuries are attributed by workers indulging in unsafe actions. There are several reasons which motivate unsafe behaviour, among others are the work pressure and lack of safety participation among workers. Implementations of engineering control measures are essential to abate the unsafe acts and unsafe work behaviour amongst workers. Safety climate could also be elevated via initiating such

endeavors because workers, who perceive that the work environment is safe and without hazards possess an elevated level of safety climate, thus are self-motivated to participate in safety activities and adhere by established safety norms. It is also imperative to implement non engineering interventions such as safety training, hiring on the basis of safety-related selection criteria, progressive disciplinary programs and terminating the employment of habitual offenders. Safety professionals have based their work on Heinrich's faulty theories platform, thus evolving into various number of theories such as the BBS and Actively Caring Model (ACM).

2.3.4.3 Theory of Planned Behaviour

Theory of Planned Behaviour (TPB) was introduced by Ajzen (1991). This auditor has designed a theory which is able to predict and explain human behaviour in specific context. According to the theory of planned behaviour, perceived behavioural control augmented by behavioural intention, can be used directly to predict behavioural achievement. Workers intention influences their behaviour and it is not a stand-alone parameter. A volatile work environment would influence the worker on whether they will perform the behaviour willingly or unwillingly.

The safety participation of most workers would be influenced by non-motivational factors as availability of requisite opportunities and resources. Production expediency which increase perceived work pressure among workers would reduce the workers control over safety behaviour. In addition a poor work environment lurking in hazards would reduce perceived safety climate of the work place, thus causing the workers to intentionally violate safety rules and circumvent safety procedures and standard

operating procedures. Safety behaviour achievements depend jointly on motivation (intention) and ability (behavioural control). The locus of control explained in this theory explains the safety participation and safety behaviour variable which has been selected for this research. Workers who do not possess a solid locus of control would engage in unsafe work behaviour when safety climate is low, thus weakening their safety participation. According to the theory of planned behaviour, perceived behavioural control augmented by behavioural intention, can be used directly to predict behavioural achievement.

TPB is a pertinent concept which is adopted in this research because workers intentions whether deliberate or unconscious would reflect their safety behaviour. Interventions of deliberate intentions which may have been caused by poor safety climate and an increase in work pressure would elevate safety behaviour, thus reducing accidents and incidents at workplace. Fogarty and Shaw (2010) explained the interactions between safety climate and workplace behaviours that are intentional but unsafe. This type of deliberations are often referred as violations and involves the deliberate deviation from rules that describe the safe or approved method of performing a particular task or job; as opposed to errors, which refer to unintended outcomes caused by workers negligence.

2.3.5 The Relationship between Safety Management Practices and Safety Behaviour

The relationship between the antecedents of safety management practices and safety behaviour is explained as below:

2.3.5.1 Management Commitment and Safety Behaviour

Muniz et al. (2012) discovered that management's commitments have positive effects on safety behaviour (safety compliance and safety participation) of employees. Zhou et al. (2008) had proven that safety was influenced by managements' commitments and co-workers' influences, and less sensitive to personal experience factors such as work experience and education. Hence, intervening attitude of the workers via commitments from the management would be able to increase workers perception of safety climate and hazards at the work place and eventually eliminate unsafe work behaviour among workers.

In one of the first investigations of safety climate, Zohar (1980) found that management's commitment to safety is a major factor affecting the success of an organization's safety programmes. Following Vredenburgh (2002), this study also includes management commitment as one of the management practices, and is measured using items related to management's priority for safety, corrective actions, safety manager attending safety meeting, accident or near miss investigation, and providing adequate personal protective equipment (PPE).

In another study conducted by Khan (2003) in the manufacturing setting involving small medium enterprises (SME), it was found that management commitment, employee involvement, safety training and education and safety incentive have significant positive relationship with safety behaviour while a disincentive has significant negative relationship with safety behaviour.

Management's commitment to safety is a fundamental factor which leads to the achievement of an organization's safety program and general employee compliance (Zohar, 1980). This commitment can be apparent through job training programs, consideration of safety in job design, and management participation in safety committees and review of the pace of work. Hence, motivating employee to perform a job in a safe manner is the responsibility of both individual's own concern with safety as well as management's expressed concern for safety (Vredenburgh, 2002).

Vinodkumar & Bhasi (2010) and Lu & Yang (2010), in their studies included management commitment to safety as one of the management practices. Consequently, an organization that is committed to safety is likely to exhibit high safety performance among healthcare workers (Mashi, 2014).

Finally, a study by Ali, Abdullah & Subramaniam (2009) examined the relationship of 6 management practices namely reward, training, management commitment, communication and feedback, hiring practice and employee participation with injury rate in the Malaysian industrial setting, similar to the study of Vredenburgh (2002). The results indicated that was found that rewards, management commitment, feedback and hiring practice have successfully reducing injury rate.

2.3.5.2. Safety Training and Safety Behaviour

Vinodkumar & Bhasi, (2010) had conducted a study on employees' perceptions on six safety management practices and self-reported safety knowledge, safety motivation, safety compliance and safety participation by conducting a survey using questionnaire among 1566 employees belonging to eight major accident hazard process industrial units in Kerala, a state in southern part of India. A 59 items questionnaire had been developed using five-likert scale. The scale consists on 1 (strongly disagree) to 5 (strongly agree). Eight hypotheses were formulated from the literature of safety management practices and safety performance. The finding of this study explains that safety knowledge and safety motivation were found to be the key mediators in explaining these relationships. Safety training was identified as the most important safety management practice that predicts safety knowledge, safety motivation, safety compliance and safety participation.

Lin & Mills (2000) found that safety training played an important role in reducing accident rates. While Lingard et al. (2009) claimed that safety training assists operatives to work more safety. While in a passenger ferry context of study done by Lu & Yang (2011) also found out that there is a relationship between safety training and both component of safety behaviour (safety participation and safety compliance). There were also studies found that safety training is correlated with safety involvement (Xuesheng & Xintao, 2011 and Xuesheng & Wenbiao, 2012).

A study on improving safety behaviour in construction projects in Libya showed that there a relationship between safety training and safety behaviour. The study was

conducted on 10 each of owners, contractors and consultants in construction projects in Tripoli City (Foad Mohamed Al-Kilani, 2011). While a study done by Lauver (2007) on "Human resource safety practices and employee injuries" also showed that there is a relationship between safety training and safety behaviour. It has been conducted on a sample of 48 workers from the Association of Business and Industry and Safety Councils in a Midwest state. Huang et al. (2006) also discovered the link between safety training and increased safety behaviour.

Hale et al. (2010) suggested that deploying interventions such as training and competency enhancement programmes with adequate support rendered by the management would improve the overall safety climate of an organization, thus alleviating workers work pressure. Trainings have received much attention in the safety literature, and several comprehensive reviews, which already exist (Ma and Yuan, 2009). This researcher suggested that improving workers' safety training is of paramount importance. The safety training should be put focus on to reduce industry injuries; and the management support is another vital factor in manufacturing concerns. Safety training was identified by Vinodkumar et al. (2010) as an essential safety management practice that predicts safety knowledge, safety motivation, safety compliance and safety participation. However workers from other nationality are often not given the opportunity to participate in safety and health related trainings due to their diverse language, which acts as a barrier (Guldenmund et al., 2012).

According to study conducted by McDonald (2003) to 18 construction site in Ireland stating that safety training is carried out without systematic schedule which primarily to "cover themselves" and protect company if something goes wrong with little expectation that it would influence the knowledge and behaviour of employees. Thus, it seems very clear that majority of employees have to gain knowledge of risks of their work through their experience of work itself.

Judith (1997) has not indicated that initial safety orientation resulted in better safety behaviour, which may indicate that safety training should be an on-going process. As an addition, she stated that firms that encourage employees to attend seminars, conferences and continuing education courses have better safety behaviour. Based on a study done by Mustazar Mansur and Peng (2009) related to effectiveness of occupational safety and health training in reducing accidents at workplace, it showed that there a relationship between safety training and safety behaviour. The study was conducted on trainee in the National Institute for Occupational Safety and Health (NIOSH) Bangi. A study conducted by Ng, Cheng and Skitmore (2005) on a framework for evaluating the safety behaviour of construction contractors showed that there is a relationship between safety training and safety behaviour. Where it plays an important role as safety factors in organisation level.

2.3.5.3 Workers' Involvement and Safety Behaviour

World Health Organization (WHO) defines involvement as a process in which individuals, groups and communities work together to drive the development of safety and engaging in safety development efforts that will ultimately affect the condition and quality of life their own (Haidar, Ahmad Fareed & Jamsiah, 2010). Workers' involvement as the explanation of behaviour such as taking part in the activities of voluntary safety or security meetings (Griffin & Neal, 2000). Meanwhile, workers involvement is crucial in building awareness of employees will be the security aspect. Forms of participation may be the involvement of employees in the development of safety programs and a survey of unsafe behaviours and actions to report the incident (Andi, 2008). Workers' involvement represents the behaviour of employees in an effort to improve safety and health, and support the goals and objectives set by the organization involved (Khaidar, Faridahwati & Subramaniam, 2011). The success of the OSH management can only be achieved through teamwork, especially all the individuals involved in the organization (Cooper, 2000). Workers' involvement is defined as involving efforts to help their subordinates to promote workplace safety program, shows initiative and educate workers about safety in the workplace (Lu & Yang, 2010).

The direct relationship between workers' involvement in safety and their participation had been linked to workers empowerment and participation (Vinodkumar et al., 2010). DePasquale et al. (1999) revealed that critical success factors which contribute towards the successful implementation of safety behaviour are related to voluntary workers involvement. Whilst a degree of forced participation could be enforced by an

organization, it was proven that such methods would deprive the employee an opportunity to self-improve, thus stalling safety behaviour improvement programmes (Shang et al., 2009).

Choudhry, Fang and Lingard (2009) have done a study on measuring safety climate of a construction company. The results showed there is a relationship between worker involvement and safety performance. It was tested on a sample in a study done by Mearns, Whitaker and Flin (2003) on a topic of safety climate, safety management practice and safety performance in offshore environment, showed that there is relationship between worker involvement and safety performance. The study was conducted on 13 offshore oil and gas installation in separate years, where total respondents are 682 and 806 respectively. Griffin & Neal (2000) based on the study of the perception of safety in the workplace a safe environment framework for linking safety performance, knowledge and motivation on 1.264 respondents among employees at seven manufacturing and mining industry in Australia. This study found that there is a positive relationship between workers involvement and safety performance.

2.3.5.4 Safety Communication and Feedback and Safety Behaviour

A study has been done to examine the level of management practices in safety culture successfully reducing workplace injuries (Ali et al., 2009). The sample consist of 68 out of 950 companies in Malaysia participated in this study. As a result, only communication and feedback and employee participation were significantly contributed

to injury rates. The study also suggested that regular feedback about safety can reduce injury rate in an organization.

Chinda (2011) noted that safety communication is of five key safety factors in planning for safety improvement at food industry. A study done by Griffin & Neal (2000) showed that there is a relationship between safety communication and safety behaviour. It has been conducted on a final sample of 1,264 employees in seven Australian manufacturing and mining organizations. While a study done by Mearns, Whitaker & Flin (2003) in offshore environment, showed that there is also a relationship between safety communication and safety behaviour. This study was conducted on 13 offshore oil and gas installation in separate years, where total respondents are 682 and 806 respectively. Besides, in a passenger ferry context of study done by Lu and Yang (2010) also found out that there is a relationship between safety communication and both component of safety behaviour (safety participation and safety compliance).

The finding of the study conducted by Cabrera, Fernaud & D´ıaz (2007), shows that communication and feedback is an important variable to control the work place hazards. Efficient communication and feed helps the upper management to take decision towards any possible hazards. Similarly, communication and feedback encourages the workplace safety behaviour and through proper reporting the management and the workers can interpret to improve safety performance (Cabrera, Fernaud & D´ıaz, 2007).

2.3.5.5 Safety Rules and Procedures and Safety Behaviour

Vinodkumar & Bhasi (2010) describes the safety rules and procedures that well established and documented by an organization and it enforcement towards safety management practices improves safety behaviour of employees at workplace. Safety rules and procedures related matters such as adequate safety department, regular safety inspection, supervisor enforcing safety rules and effective safety and health rules and procedures in place to prevent accident occurring. "Well documented safety rules and procedures and its enforcement by supervisors and managers can improve safety behaviour of workers" (Vinodkumar & Bhasi, 2010). Similarly, study by Mearns et al. (2003) found a significant correlation between safety rules and procedures and accident rates.

In this study, safety behaviour is expressed in term of employee compliance to the organisation safety rules and procedures as well as voluntarily participation in safety programs and initiative (Neal & Griffin, 2002). Safety compliance is directly contributed to personnel safety and represents the core activities that need to be performed to maintain workplace safety. The basic compliance is requirement for the use of personnel protective equipment which is enforced by many organizations and also mandated by authority under the OSHA 1994. Safety participation described the behaviours that do not directly contribute to employee personal safety but help to create an environment that support safety at workplace.

2.3.5.6 Safety Promotion Policies and Safety Behaviour

The organization reward system is the standards, rules and procedures connected with the compensation and allocation of benefits to employees for a job well done and motivation or anything given in recognition of effort or achievements. The reward has a direct impact on desirable behaviour when it increases (Geller and Wiegard, 2005). Many empirical studies have found rewards can enhance work-related outcomes (Khan, 2010 and Oluleye, 2010). Within the context of safety, Eiff (1999) found equitable reward system is necessary to motivate individuals to behave safely.

2.4 Summary

All six facets of safety management practices variables (e.g. management commitment, safety training, workers' involvement, safety communication and feedback, safety rules and procedures and safety promotion policies) influences on safety behaviour outcome. The conceptual framework was designed based on the literature review above.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

The purpose of this chapter is to explain on the methodological aspects in collecting empirical evidence, procedures and information needed to achieve the study objectives. The independent variables and dependent variables are demonstrated conceptually and operationally. This study considered determining reliable methods of measuring the contributing measures of safety management practices on safety behaviour namely safety participation and safety compliance by providing an explanation on theoretical framework, data collection, research instruments, population, sample and data analysis method.

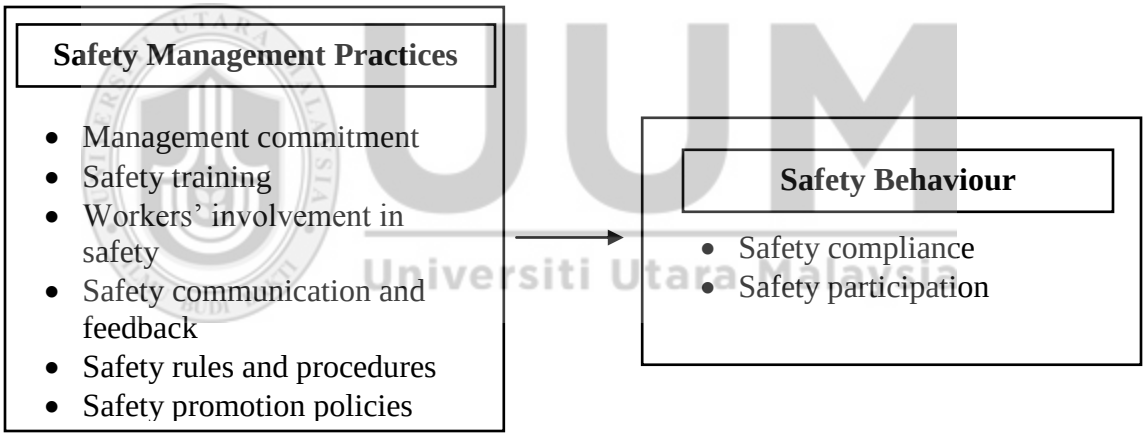
3.2 Theoretical Framework

According to Sekaran (2005), the theoretical framework is a conceptual model of how one theorizes the relationships among the several factors that have been identified as important to the problem area in a research. This study will be conducted to investigate the relationship between safety management practices namely management commitment, safety training, workers' involvement in safety, safety communication and feedback, safety rules and procedures and safety promotion policies which serve as independent variable to the compliance to safety behaviour namely safety compliance and safety participation as dependent variable. A comprehensive theoretical framework was developed based on the literature review whereby the framework of this study

consists of six independent variables of safety management practices where these independent variables will later tested their relationship on the dependent variable of compliance with safety behaviour namely safety compliance and safety participation as illustrated in Figure 3.1. The model was constructed from a study conducted by Vinodkumar & Bhasi in 2010.

The theoretical framework of this study is depicted as in Figure 3.1 below.

Figure 3.1
Theoretical Framework



3.3 Conceptual or Operational Definitions

The conceptual or operational definitions of each facet of safety behaviour and safety management practices are as follows:

Safety behaviour defines the behaviour that supports safety practices and activities that need to be accepted by employees according to occupational, safety and health requirements to avoid workplace accidents (Zin & Ismail, 2012). Safety compliance is

directly contributed to personnel safety and represents the core activities that need to be performed to maintain workplace safety. The basic compliance is not only the use of personnel protective equipment (PPE) but compliance with the rules and regulations that have been established and enforced by the employers as required by Section 24 of Occupational Safety and Health Act, 1994. Safety participation described the behaviours that do not directly contribute to employee personal safety but help to create an environment that support safety at workplace (Zin & Ismail, 2012).

According to Ali, Abdullah & Subramaniam (2009), stated that safety management practices are an important factor of an organization‘s and it plays an effective role in reducing workplace injuries. Employer should demonstrate their commitment through strongly realization of safety compliance and participation to safety requirements and ensure that everyone in the organization is certain about their safety and health responsibilities (Fernando et al., 2008).

Management commitment is agreed as the main significant factors by many researchers in occupational literature (Zin & Ismail, 2012). Top management should actively lead the organization and employees towards achievement of organization safety goals by showing that organization is serious about safety.

An organization that wants its employees to be active participants in safety activities should give them proper training. Similarly, safety training can be a means by which accident can be predicted (Mashi, 2014). In addition, providing safety and health training enables workers to know how to work safely and help organization to avoid

litigation as a result of an accident. Effective safety training is important to educate employees on potential of accidents, how to prevent accidents and potential hazards involved in their jobs.

Worker involvement in safety involves the flow of information upward and decision making process within the organization (Mashi, 2014). The main reasons why workers should involve in safety management decision is to help in developing ways of protecting workers and help organization to develop measures of preventing occupational accidents in a timely and effective manner.

The poor safety communication and feedback will not help the organization to improve safety at workplace (Nur Atiqah Jumain & Haslinda Abdullah, 2014). Regular communication related to safety issues between managements, supervisors and workforce is an effective management practice to improve safety in workplace (Vinodkumar & Bhasi, 2010).

"Well documented safety rules and procedures and its enforcement by supervisors and managers can improve safety behaviour of workers" (Vinodkumar & Bhasi, 2010).

Safety promotion policy is the organization reward system which is the standards, rules and procedures connected with the compensation and allocation of benefits to employees for a job well done and motivation or anything given in recognition of effort or achievements. The reward has a direct impact on desirable behaviour when it increases

(Geller & Wiegard, 2005). Many empirical studies have found rewards can enhance work-related outcomes (Khan, 2010; Oluleye, 2010).

3.4 Measurement of Variables or Instrumentation

The contents and substance of the variables (e.g. management commitment safety training, workers' involvement in safety, safety communication and feedback safety rules and procedures, safety promotion policies with safety compliance and participation) of this research will be taken from the previous questionnaires of Cheyne et al., (1998), Cox and Cheyne (2000), Coyle et al., (1995), Flin et al., (2000), Glendon & Litherland (2001), Neal et al., (2000), Varonen & Matilla (2000), Vredenburgh (2002), Williamson et al., (1997) and Zohar (1980).

The dual languages (e.g. English and Bahasa Malaysia) questionnaire contained 24 questions to measure the perceptions of the employees about the six safety management practices and 8 questions to measure self-rated safety compliance and safety participation. This was prepared based on review of related literature and theory and it contained questions covering areas of management commitment (6 items), safety training (5 items), workers' involvement (4 items), safety communication and feedback (3 items), safety rules and procedures (3 items), safety promotion policies (3 items), safety compliance (4 items) and safety participation (4 items).

Each item was measured on a Likert scale. A Likert scale is a type of response scale often used in questionnaires, and is the most widely used scale in questionnaire survey based research (Geller et al., 1996; Grote and Kunzler, 2000). In this research,

respondents will asked to give their preference on a 5-point Likert scale (strongly disagree, disagree, neither disagree nor agree, agree, and strongly agree) in order to evaluate the respondents' level of agreement with each item.

3.5 Hypotheses Development

Based on the previous literature, the hypotheses of the study could be developed and furthermore enables the process of the relationships testing. Hypotheses have been developed in the study to express the relationship between safety management practices consisting of management commitment, safety training, workers' involvement in safety, safety communication and feedback, safety rules and procedures and safety promotion policies with safety compliance and participation among workers in the steel fabrication construction company.

H1a: There is a significant relationship between management commitment with safety compliance among workers in the steel fabrication construction company.

H1b: There is a significant relationship between management commitment with safety participation among workers in the steel fabrication construction company.

H2a: There is a significant relationship between safety training with safety compliance among workers in the steel fabrication construction company.

H2b: There is a significant relationship between safety training with safety participation among workers in the steel fabrication construction company.

H3a: There is a significant relationship between workers' involvement in safety with safety compliance among workers in the steel fabrication construction company.

H3b: There is a significant relationship between workers' involvement in safety with safety participation among workers in the steel fabrication construction company.

H4a: There is a significant relationship between safety communication and feedback with safety compliance among workers in the steel fabrication construction company.

H4b: There is a significant relationship between safety communication and feedback with safety participation among workers in the steel fabrication construction company.

H5a: There is a significant relationship between safety rules and procedures with safety compliance among workers in the steel fabrication construction company.

H5b: There is a significant relationship between safety rules and procedures with safety participation among workers in the steel fabrication construction company.

H6a: There is a significant relationship between safety promotion policies with safety compliance among workers in the steel fabrication construction company.

H6b: There is a significant relationship between safety promotion policies with safety participation among workers in the steel fabrication construction company.

3.6 Research Approach and Design

This research is a descriptive study using quantitative and will adopt a cross-sectional approaches in data gathering appropriately designed to meet the objectives of the research and assist towards the findings. The main purpose of this study is to determine whether safety management practices can affect the participation and compliance among workers in the steel fabrication construction company.

According to Sekaran (2005), the independent variable is one that influences the dependent variable in either positive or negative way. That is when the independent variable is present, the dependent variable is also present, and with each unit of increase in the independent variable, there is an increase or decrease in the dependent variable also. In other words, the variance in the dependent variable is accounted for by the independent variable. While, the dependent variable is the variable of primary interest to the researcher. The researcher's goal is to understand and describe the dependent variable, or to explain its variability, or predict it. In other words, it is the main variable that lends itself for investigation as a viable factor. Through the analysis of the dependent variable, it is possible to find answers or solutions to the problem. To do this, we need to quantify and measure the dependent variable, as well as other variables that influence this variable.

3.7 Sampling and Sampling Procedure

Sampling is the process of selecting a sufficient number of elements from the population, so that a study of the sample and an understanding of its properties or characteristics would make it possible for us to generalize such properties or characteristics to the population elements (Sekaran, 2005). Practically, a research study is carried out on a sample from a population. The goal is to be able to find out true facts about the sample that will also be true about the population. According to Sekaran (2005), sampling size and sampling procedure are very important. A suitable sampling size and procedure helps the researcher to draw conclusions that would be generalized to the population of interest.

In this study, probability sampling method specifically named simple random sampling was used to select the samples from population. This sampling method was used due to two main reasons. First, each element in the population will have equal chance of being selected as the sample (Zikmund et al. 2013). Second, its ease of use and accurate representation of the larger population.

The samples or respondents in this study are employee of steel fabrication construction company which includes management staffs and non-management staffs. Management staffs refer to those who are in position as clerk, executives and managers. The non-management staffs are those workers who report to the management staffs. Krejcie and Morgan (1970) greatly simplified size decision by providing a table that ensures a good decision model. Table 3.1 provides that generalized scientific guideline for sample size decision (Sekaran & Bougie, 2010). The suggested sample size for given population of 250 is approximately 152 respondents. However, for this study, total of 161 samples will be selected randomly from the whole population. After the determination of sample size, 161 questionnaires will be distributed to the respondents by providing them an adequate time to complete. The complete questionnaires will be collected immediately. The survey will take about three weeks for completion.

Table 3.1
Sample Size for a Given Population Size

N	S	N	S	N	S
10	10	220	140	1200	291
15	14	230	144	1300	297
20	19	240	148	1400	302
25	24	250	152	1500	306
30	28	260	155	1600	310
35	32	270	159	1700	313
40	36	280	162	1800	317
45	40	290	165	1900	320
50	44	300	169	2000	322
55	48	320	175	2200	327
60	52	340	181	2400	331
65	56	360	186	2600	335
70	59	380	191	2800	338
75	63	400	196	3000	341
80	66	420	201	3500	346
85	70	440	205	4000	351
90	73	460	210	4500	354
95	76	480	214	5000	357
100	80	500	217	6000	361
110	86	550	226	7000	364
120	92	600	234	8000	367
130	97	650	242	9000	368
140	103	700	248	10000	370
150	108	750	254	15000	375
160	113	800	260	20000	377
170	118	850	265	30000	379
180	123	900	269	40000	380
190	127	950	274	50000	381
200	132	1000	278	75000	382
210	136	1100	285	1000000	384

3.8 Measures

In this study, the data collection method used will be a structured survey, that is, a questionnaire to pull together data (Appendix A). Participants need 10 till 15 minutes to fill all section in the questionnaire and it is a confidential exercise. The questionnaire is divided into three sections: (A) Demographic Information (B) Safety Management Practices (C) Safety Behaviour.

Section A was set to obtain the employees' demographic and work-related particulars. This included job title, gender, age, years of working experience, working experience in the current company, highest education level, marital status, any accidents experiences, attended on occupational safety training and how often attend to safety training.

Section B, Safety Management Practices, is required to assess employees' perception about management commitment, safety training, workers' involvement, safety communication and feedback, safety rules and procedures and safety promotion policies influences towards their participation and compliance on occupational safety and health at workplace. The options provided as responses were on 5-point Likert scale ranging from Strongly Disagree to Strongly Agree. There were negative questions in the survey which were used by researcher.

Section C on employees' safety behaviour namely safety participation and safety compliance will be measured. The items will be measured on five-point Likert scale selection from Strongly Disagree to Strongly Agree. A high score on each statement implies agreement with the statement, hence indicating high perception on safety behaviour.

3.9 Data Collection

The study will be conducted in four steps. First, before administering questionnaires to the respondents, the researcher will brief the management of the steel fabrication construction company on the main purpose of the study in order to obtain the permission to conduct the research besides to earn their full cooperation. Second, the dates for the

administration of the questionnaires will be fixed. Third, briefing session regarding completing the questionnaires will be conducted to the head of departments at their respective workstations. Fourth, the questionnaires will be distributed by the researcher to all managerial and non-managerial staffs to respond and collect immediately upon completion. This session will take three weeks of administration. 161 questionnaires will be distributed.

3.10 Data Analysis

This section describes the statistical tools used for data analysis, including the purpose for each statistical tool used. The Statistical Package for the Social Science (SPSS) computer program version 21.0 was utilized to perform the statistical analysis. The use of SPSS version 21 in analysing the data helps the researcher to organize and interpret the data. SPSS software also helps to determine the appropriate statistical technique to be used to test the hypothesis. Five types of analysis were performed namely reliability analysis, descriptive sample analysis, descriptive main variable analysis, correlation analysis and regression analysis. Reliability analysis is important to check the dependability of the data. According to Sekaran (2005), all data entries have to be checked to ensure that subsequent analysis and findings were credible, this was to establish the reliability of the data. Cronbach's alpha coefficient used to measure the core reliability. In reliability analysis, the figure will be measured using Cronbach's Alpha. It determines how well the measured items are positively related to one another. Nunnaly (1994), stated that Cronbach's Alpha of 0.7 or greater is acceptable in social sciences research. Reliability of a measure is established by using both consistency and stability

test. The closer Cronbach's Alpha to 1.0, the higher the internal consistency reliability is. Cronbach's Alpha measures are as Table 3.2 below.

Table 3.2

Cronbach's Alpha Measures

Cronbach's Alpha	Reliability
0.8 and above	good
0.7	acceptable
0.6 and below	poor

The data will further be analysed using descriptive analysis to describe the characteristic of the samples, including the demographic sample. The mean and standard deviation values will be used to describe these particular demographic samples (e.g. gender, age, total working experiences, working experiences with the current organisation, educational level, marital status, occupational accident, and training. Similarly, the descriptive analysis will be performed to discover the mean and standard deviation for safety management practices variables and also the safety behaviour variables.

The Pearson correlation will be conducted to measure the significance of linear bivariate relationship between the independent and dependent variables. While the multiple regression analysis will be used to determine the relationship between independent and dependent variables, the direction of the relationship, the degree of the relationship and also strength of the relationship. This test is a more rigorous test compared to the

Pearson correlation because it takes the compounding effect of the independent variables when the relationship is tested.

3.11 Pilot Study

A pilot study is a mini version of data collection before the final data collection commences. This study is useful to identify the limitations reflected in the questionnaire by adapting a probability sample that acts as the guideline for the final study (Thabane et. al., 2010). Identified weaknesses will be corrected suitably and ensure the questionnaire is comprehensible and useful in pulling together required data. A pilot study is used to identify the questionnaire's reliability and validity. For the purpose of this study, 30 respondents will be considered for the pilot study. The results of pilot study is shown in Table 3.3 below:

Table 3.3
Reliability Analysis Result for Pilot Testing

Items	**Pilot Study**		**Final Study**	
	No. of Questions	Cronbach Analysis	No. of Questions	Cronbach Analysis
Management commitment	9	0.6	6	0.8
Safety training	6	0.8	5	0.8
Workers' involvement	5	0.6	4	0.7
Safety communication and feedback	3	0.7	3	0.7
Safety rules and procedures	5	0.5	3	0.8
Safety promotion policies	4	0.4	3	0.6
Safety compliance	7	0.5	4	0.7
Safety participation	5	0.7	4	0.7
TOTAL	44		32	

3.12 Summary

The process of data collection and analysis of data is important to determine whether a hypotheses in a research is supported or rejected. Based on the statistical analysis as well, the relationship between independent variables and dependent variable of current research will be revealed. Furthermore, the data analysis result should express whether the conducted research has met it objectives or otherwise.

CHAPTER 4

FINDINGS OF THE STUDY

4.1 Introduction

This chapter summarizes the results from the data collected and analyses process based on the statistical methods applied to get to the bottom of the research objectives. All data were analyzed using Statistical Package for the Social Sciences (SPSS) version 21. The data were examined in terms of reliability, descriptive analysis, correlation and regression. Frequency analysis was utilized for analyzing the respondents' demographic details. The statistical method of Pearson Correlation was used to determine the existence of any relationships between the independent variable and dependent variable. Finally, regression analysis was conducted to identify which independent variables are the most significant to compliance with safety behaviour among the employees in steel fabrication construction company.

4.2 Response Rate

A total of 161 questionnaires were distributed to the respondents who are the steel fabrication construction company based in Shah Alam, Selangor. Brief explanations were given to the respondents regarding the purpose of the present study and were granted confidentiality of their responses. The respondents were given sufficient time period to complete the questionnaires and were collected immediately from the respondents once answered completely by them. The percentage of response was 100%. Table 4.1 summarized the response rate of the survey.

Table 4.1
Response Rate

Items	Total	Percentage (%)
Distributed Questionnaires	161	100
Collected Questionnaires	161	100
Unreturned Questionnaires	0	0
Completed Questionnaires	161	100

4.3 Respondents' Demographic Background

Respondents' demographic profiles are described in Table 4.2 below:

Table 4.2
Demographic Characteristics of the Respondents

Demographics	Frequency	Percentage (%)
Job title		
Managerial	12	8
Executives	32	20
Supervisors	13	8
General Workers	68	42
Others	36	22
Gender		
Male	141	88
Female	20	12
Age		
18-30 years old	57	36
31-50 years old	86	53
51 and above	18	11
Total working experience		
1-5 years	46	29
6-10 years	50	31
Above 10 years	65	40

Working experience with current organisation		
1-5 years	78	48
6-10 years	54	34
Above 10 years	29	18
Education		
Secondary	79	49
Certificate	16	10
Diploma	24	15
Degree	15	9
Masters and above	1	1
Others	26	16
Marital status		
Married	107	67
Single	51	31
Divorced	3	2
Occupational accident		
Yes	23	14
No	138	86
Frequency of accident (if yes)		
1-3 times	22	96
4-8 times	1	4
9-15 times	-	-
Over 15 times	-	-
Safety training		
Yes	134	83
No	27	17
Frequency of safety training (if yes)		
Every month	2	1
Once in 3 months	9	6
Once in 6 months	15	9
Once a year	108	67
Not at all	27	17

Table 4.2 shows that the largest group of respondents is general workers (42%), others (22%), executives (20%) and managerial and supervisors (8%). Middle and higher management level only represented a small percentage of the total employees in the steel fabrication construction company. This means that the results of the study are mostly derived from the workers' and technicians' opinion that are actually engaged with the operational work rather than supervisors and Managers who are more involved in the management work.

The analysis of the data of this study revealed that the male respondents were the majority. There were 141 male and 20 female respondents out of the 161 respondents. Male respondents constituted to 88 % and female respondents constituted to 12 % of the total 161 respondents. It shows that, the results of the study are mostly derived from the male respondents' opinion.

In terms of age, the respondents who had their age in the interval between 31 to 50 years old, constituted to 53% of the respondents. This is followed by the respondents between the ages of 18-30 (36%) and 51 and above (11%). Employees with the age of above 51 are those whose services are extended after their retirement age of 60 on a contract basis due to their skills in certain work area.

The largest group of respondents is the employees who have been working for more than ten years, which consisted of 40% of the respondents. This is followed by those who worked for six to ten years (31%) and lastly one to five years of service (29%). Employees between the ages of 31-50 years old consists of majority the workforce

(53%) indicating that all these employees have been faithfully working for this company for more than 10 years.

The largest group of respondents is the employees who have been working for from one to five years, which consisted of 78 respondents or 48%. This is followed by those who worked for five to ten years (54 respondents or 34%) and lastly above ten years of service (29 respondents or 18%). The respondents working for one to five years consists majority of the respondents. The survey on age revealed that even been employees between the ages of 30 to 55 years old consists of majority the workforce (53%) but all these employees have working for this company for less than 5 years.

The study on education background revealed that the largest group of respondents is with secondary qualification, which consisted to 79 (49%) of the respondents. The second largest group is those with others which consisted of 26 (16%) of the respondents. This is followed by respondents with diploma (15%), certificate (10%), degree (9%) and Master's degree and above (1%). This means that majority of the respondents were those with secondary level. Those employees with higher education background only represented a small percentage of the total employees in the steel fabrication construction company.

Married status were 107 respondents (67%), 51 respondents (31%) are single and divorced/widowed are 3 respondents (2%). The results shows that most the respondents provided feedback in this study were married employees in the steel fabrication construction company.

Majority of the respondents 138 (86%) responded that they have not met an accident since working with the current organization. Only 23 respondents (14%) responded that they have met with an accident and 22 respondents (96%) out of 23 respondents indicated that they had an accident one to three times since working with steel fabrication construction company. The remaining 1 respondent (4%) had an accident four to eight times since working with the current organization.

The table shows the classification of respondents attended to safety training in the steel fabrication construction company. 134 respondents (83%) have attended the safety training. Only 17% or 27 respondents not attended the safety training. Majority of the respondents (108 or 67%) indicated that they have attended the safety training once a year, 15 respondents (9%) once in six months, 9 respondents (6%) once in three months and 2 respondents (1%) on every month. A total of 27 respondents (17%) not attended training at all.

4.4 Reliability Analysis

According to Sekaran & Bougie (2010), the closer reliability coefficient gets to 1.0, the better it is, and those values over 0.80 are considered as good. Those values in 0.70 are considered as acceptable and those reliability values less than 0.60 are considered to be poor (Sekaran & Bougie, 2010). The current study produced satisfactory reliability and all the independent and dependent variables met the above requirement range within 0.60 to 0.80.

As presented in table 4.3, the Cronbach‟s Alpha coefficient for safety training is above 0.80. Nevertheless, the alpha value for management commitment, workers' involvement and safety compliance are above 0.70. Meanwhile other variables are above 0.60. The total of initial items were 44 with reliability range from 0.40 to 0.80. After twelve items were deleted (management commitment 3 items, safety training 1 item, workers' involvement 1 item, safety rules and procedures 2 items, safety promotion policies 1 item, safety compliance 3 items and safety participation 1 item), the reliability ranged from 0.60 to 0.80.

Table 4.3
Reliability Analysis Before and After Items Deleted

Variables	No. of Initial Items	Cronbach's Alpha	No. of Final Items	Cronbach's Alpha
Management commitment	9	0.61	6	0.74
Safety training	6	0.75	5	0.82
Workers' involvement	5	0.64	4	0.72
Safety communication and feedback	3	0.66	3	0.66
Safety rules and procedures	5	0.50	3	0.69
Safety promotion policies	4	0.45	3	0.62
Safety compliance	7	0.50	4	0.72
Safety participation	5	0.73	4	0.68
TOTAL	44		32	

4.5 Descriptive Analysis

Descriptive analysis which includes the mean and standard deviation values for the independent and dependent variables are attained and documented in table 4.4. The mean value is a measure of central tendency that offers a general picture of the data without unnecessarily inundating one with each of the observations in a data set (Sekaran & Bougie, 2010). More simply, mean value is the average of all values in a given data set. The mean is a descriptive statistic that measures the centre of balance of the data. The mean is often quoted along with the standard deviation. The mean describes the central location of the data whereas the standard deviation describes the spread. All the variables were evaluated based on a five-point rating scale ranging from 1 (*strongly disagree*) to 5 (*strongly agree*). Looking at the table 4.4, safety promotion policies had recorded the least mean value of 2.71 (*SD*=0.70) compared with other variables. It means most of the respondents almost agreed that safety management practices influences safety participation and safety compliance.

Table 4.4
Descriptive Statistics for Main Variables

Variables	Mean	Std. Deviation	N
Management Commitment	3.87	.41	161
Safety Training	3.85	.45	161
Workers' Involvement	3.70	.45	161
Safety Communication and Feedback	3.73	.44	161
Safety Rules and Procedures	3.73	.41	161
Safety Promotion Policies	2.71	.69	161
Safety Compliance	4.08	.44	161
Safety Participation	3.76	.43	161

4.6 Pearson Correlation Analysis

Correlation is frequently used as a descriptive tool in non-experimental research (Pakisamy, 2012). The intensity of the correlation is expressed by a number called the Pearson coefficient of correlation which is always denoted by letter, r. The main idea behind the coefficient of correlation is to compute an index which reflects how much two variables are related to each other. Table 4.5 displays the results of a correlation analysis between safety management practices with safety behaviour (safety compliance and safety participation).

Table 4.5
Pearson Correlation Analysis

		Management Commitment	Safety Training	Workers' Involvement	Safety Communication and Feedback	Safety Rules	Safety Promotion Policies	Safety Compliance	Safety Participation
Management Commitment	Pearson Correlation	1							
	Sig. (2-tailed)								
	N	161							
Safety Training	Pearson Correlation	.569**	1						
	Sig. (2-tailed)	.000							
	N	161	161						
Workers' Involvement	Pearson Correlation	.635**	.591**	1					
	Sig. (2-tailed)	.000	.000						
	N	161	161	161					
SafetyCommunication and Feedback	Pearson Correlation	.510**	.628**	.613**	1				
	Sig. (2-tailed)	.000	.000	.000					
	N	161	161	161	161				
Safety Rules	Pearson Correlation	.495**	.548**	.592**	.653**	1			
	Sig. (2-tailed)	.000	.000	.000	.000				
	N	161	161	161	161	161			

SafetyPromotion Policies	Pearson Correlation	.189*	.059	.022	-.183*	-.021	1		
	Sig. (2-tailed)	.017	.455	.780	.020	.794			
	N	161	161	161	161	161	161		
Safety Compliance	Pearson Correlation	.414**	.454**	.307**	.347**	.428**	.046	1	
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.562		
	N	161	161	161	161	161	161	161	
Safety Participation	Pearson Correlation	.463**	.483**	.384**	.321**	.484**	.357**	.521**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	
	N	161	161	161	161	161	161	161	161

**. Correlation is significant at the 0.01 level (2-tailed).

Table 4.5 shows the correlation between the six elements of safety management practices and safety compliance and safety participation. The results indicated that out of six variables only five variables (management commitment, safety training, workers' involvement, safety communication and feedback and safety rules) have positive significant correlation with safety compliance. The safety training score is 0.48 and shows the strongest relationship with safety compliance, followed by safety rules 0.43 while safety promotion policies indicated no significant relationship with score of 0.05 with safety compliance. For the management commitment, workers' involvement and communication and feedback were indicating moderate positive significant relationship with scores of 0.41, 0.31 and 0.35 respectively.

Meanwhile, for safety participation all the six safety management practices were significantly related. The safety rules indicated highest relationship with safety participation with score of 0.48, followed by safety training 0.48 and management commitment 0.46. The other safety management practices (e.g. workers' involvement, safety communication and feedback and safety promotion policies) indicating a positive relationship with safety participation with score of 0.38, 0.32 and 0.36.

4.7 Hypotheses Testing

In this study, twelve main hypotheses were generated. Multiple regression analysis was used to analyze the hypotheses. The results obtained and its interpretation is discussed precisely as below.

4.7.1 Hypotheses Testing for Safety Compliance and Safety Participation

Table 4.6 and 4.7 below describes the relationship between the six management practices variables with safety compliance and safety participation in the steel fabrication construction company.

Table 4.6
Multiple Regression Results on Safety Compliance

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.651	.349		4.730	.000
Management Commitment	.253	.105	.233	2.411	.017
SafetyTraining	.278	.095	.285	2.916	.004
Workers' Involvement	-.139	.100	-.143	-1.391	.166
Safety Communication and Feedback	-.040	.110	-.040	-.367	.714
Safety Rules	.285	.103	.267	2.765	.006
Safety Promotion Policies	-.009	.047	-.013	-.180	.857

Note:
F value : 10.071 at $p < 0.05$
R : 0.531[a]
R^2 : 0.282
Adjusted R^2 : 0.254

Independent/constant variables: Management commitment, safety training, workers' involvement, safety communication and feedback, safety rules and safety promotion policies

Dependent Variable: Safety compliance

Table 4.7
Multiple Regression Result on Safety Participation

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	d. rror	Beta		
(Constant)	.718	.304		2.362	.019
Management Commitment	.148	.092	.139	1.613	.109
Safety Training	.238	.083	.249	2.870	.005
Workers' Involvement	-.022	.087	-.023	-.257	.798
Safety Communication and Feedback	-.051	.095	-.052	-.538	.591
Safety Rules	.347	.090	.333	3.878	.000
Safety Promotion Policies	.196	.041	.314	4.757	.000

Note :
F value : 19.532 at $p < 0.05$
R : 0.657[a]
R^2 : 0.432
Adjusted R^2 : 0.410

Independent/constant variables: Management communication, safety training, workers' involvement, safety communication and feedback, safety rules and safety promotion policies

Dependent Variable: Safety participation

The multiple regression results shows the relationship between management commitment and safety compliance was significant (β=0.25 at p<0.05). It suggests that hypothesis 1a (there is a significant relationship between management communication and safety compliance) was supported. Hypotheses 1b stated that there is significant relationship between management communication and safety participation. The results show that the relationship between management communication and safety participation (β=0.15 at p>0.05) was not significant. Thus, the hypothesis 1b was rejected.

The relationship from safety training to safety compliance (β=0.28 at $p<0.05$) was significant. Hence, a hypothesis 2a (there is a significant relationship between safety training and safety compliance) was supported. Hypotheses 2b propose that there is a significant relationship between safety training and safety participation. The results show that the relationship between safety training and safety participation was statistically significant with coefficient of 0.24 at $p<0.05$. Thus, hypotheses 2b was supported.

The relationship from workers' involvement to safety compliance and safety participation were not significant with coefficient of -0.14 and -0.02 at $p>0.05$. These indicated that the workers' involvement was not significantly related to safety compliance and safety participation. Thus, hypotheses 3a (there is a significant relationship between workers' involvement and safety compliance) and 3b (there is a significant relationship between workers' involvement and safety participation) were not supported.

Hypotheses 4 suggested that (a) there is a significant relationship between safety communication and feedback with safety compliance and (b) there is a significant relationship between safety communication and feedback with safety participation. The results showed that the relationship from safety communication and feedback to safety compliance and safety participation were not significantly related with coefficient of -0.04 at $p>0.05$ and -.05 at $p>0.05$. Thus, hypotheses 4a and 4b were not supported.

The hypotheses 5 specified that (H5a) there is a significant relationship between safety rules and safety compliance, and (H5b) there is a significant relationship between safety rules and safety participation. For hypotheses 5a and 5b, the results were statistically significant with coefficients of 0.29 and 0.35 at $p<0.05$ respectively. Thus, the hypotheses 5a and 5b were supported.

Finally, the relationship between safety promotion policies and safety compliance was not significant ($\beta=0.01$ at $p>0.05$). Thus, the hypotheses 6a (there is a significant relationship between safety promotion policies and safety compliance) was not supported. Hypotheses 6b stated that there is a significant relationship between safety promotion and safety participation). The results indicated that the relationship between safety promotion policies and safety participation ($\beta=0.20$ at $p<0.05$) was significant. Thus, the hypothesis 6b was supported. Table 4.8 presents summary of hypotheses results.

Table 4.8
Hypotheses Results

Hypotheses	Result
Hypotheses 1a: There is a significant relationship between management commitment and safety compliance.	Supported
Hypotheses 1b: There is a significant relationship between management commitment and safety participation.	Not supported
Hypotheses 2a: There is a significant relationship between safety training and safety compliance.	Supported
Hypotheses 2b: There is a significant relationship between safety training and safety participation.	Supported

Hypotheses 3a: There is a significant relationship between workers' involvement and safety compliance.	Not supported
Hypotheses 3b: There is a significant relationship between workers' involvement and safety participation.	Not supported
Hypotheses 4a: There is a significant relationship between safety communication and feedback and safety compliance.	Not supported
Hypotheses 4b: There is a significant relationship between safety communication and feedback and safety participation.	Not supported
Hypotheses 5a: There is a significant relationship between safety rules and procedures, and safety compliance.	Supported
Hypotheses 5b: There is a significant relationship between safety rules and procedures, and safety participation.	Supported
Hypotheses 6a: There is a significant relationship between safety promotion policies and safety compliance.	Not supported
Hypotheses 6b: There is a significant relationship between safety promotion policies and safety participation.	Supported

4.8 Summary

This chapter had presented the finding of the data analysis. In the earlier section, respondents' demographic characteristics were described. It was followed by reliability analysis, descriptive analysis, Pearson correlation analysis and reliability analysis. Six out of twelve hypotheses were supported. Focuses on the discussion of finding, theoretical and practical contribution and implications, the limitation of present study and suggestion for future research will be discussed in the next chapter.

CHAPTER 5

CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter will discuss the results revealed from the present research which examines the influence of six management practices variables with safety compliance and safety participation among the employees of a steel fabrication construction company. The second part would include implication of the current study followed by suggesting the realistic approach to improve the safety compliance and safety participation among the employees. At the end of this chapter, the limitation confronted during the current study will be highlighted. Finally, the conclusion of the present study will also be provided in this chapter.

5.2 Discussion

This study mainly focuses on investigating the influence of safety management practices on safety behaviour (safety compliance and safety participation) especially among employees of steel fabrication construction company. The following section will discuss the result of the hypotheses of this study based on theories and previous empirical evidences.

5.2.1 Management Commitment with Safety Compliance and Safety Participation

In this study it was hypothesized that there will be a significant relationship between management commitment and safety behaviour namely safety compliance and safety participation. The study found that management commitment is significantly related to

safety compliance. The findings are consistent with the previous empirical investigation in the manufacturing sector (Fernandez-Muniz, 2009; Parker et al., 2001 and Zohar, 1982) and among hospital employees (Vrendenburgh, 2002).

There are several plausible reasons that could explain the significant relationship, firstly the constituted joint safety and health committee at workshop and departmental level supports the realization management's engagement in safety matters (Zohar 2008; Zhou et al., 2008). Secondly, accountability of managers towards safety and health at workplace namely participated in the safety and health committee in both workshop and departmental level, discussion on safety and health with the safety and health practitioners, dialogue among local area and line leaders within the establishment of safety and health representatives, participated in the joint safety and health inspection, investigations of employees complaint with safety and health representatives, involvement in reporting and monitoring on OSH, access of safety and health representatives to employees and access to have training for safety and health representatives (Zohar, 2010).

Finally, the responsibility of top management or Managing Director as a chairman of the Safety and Health Committee in the organisation. In this connection, management could increase their commitments with respect to the creation of a good team working environment and the encouragement of positive workmate's influences within teams, which is a notion shared by Zhou et al. (2008). This could be enhanced by the involvement of top management as evidenced by Hale et al. (2010); Wu et al. (2008) and Khader (2004). It can be argued that employees' perception of management commitment

give an overall picture derived from the totality of the employees' assessment about the interest of the management in the safety and health of employees as manifested in various activities and initiatives of the management towards safety (Vinod Kumar & Bhasi, 2010). The direct influence of management commitment on safety can be considered as a result of individual wisdom of the employees, earned from the overall interest shown by the managements towards the safety of their employees, to protect themselves from accidents.

However, the results of this study revealed that management commitment did not significantly influences the safety participation. This is contrary with the initial hypothesis which indicated that there will be a significant relationship between management commitment and safety participation. Management should be visible to workers and reflect good safety practices (CPWR, 2014). In this study, messages about the management commitment to safety are sent down the "chain of command" rather than being delivered face-to-face. Usually the messages will send by Safety and Health Officer (SHO), supervisors and team leaders. Workers are more likely to appreciate, value, and internalize the safety messages if they are occasionally delivered by higher-level management.

Second, insufficient resources to effectively implement safety activities in the organisation. While written safety policies and procedures are necessary, it is critical that management make available sufficient resources for effective implementation and maintenance of safety-related activities. In this organisation, insufficient budget

allocation for ongoing education, including leadership or communication training for supervisors, training for foreign workers in the organization, and also purchasing and providing appropriate PPE for everyone onsite. Investing in systems for collecting information on incidents and close calls, safety climate, and effectiveness evaluation of any changes made also clearly demonstrates management commitment to continuously improving safety participation. Lacking of safety commitment by the management can be a barrier to workers behaviour change and engagement (Lunt et al. 2008). Moreover, it leads to poor inspection programs, poor safety policies, incomprehensive accident prevention policies and insufficient education program (Abdul Rahim, et al. 2008).

Management should actively participate in all meetings at all levels where hazards are reviewed. If it's a meeting where safety is not typically discussed, management should take the initiative to start the discussion. These types of behaviours provide a direct line of communication between workers and management and encourage participation of employees on safety and health matters.

In this organisation, the management does not provide any specific reward structures to encourage workers to proactively identify hazards, and report close calls as well as injuries. This would be one of the probability for workers not participate in the safety and health matters in the workplace.

Finally, when a safety situation arises, management in this organisation failed to take the employee's concern seriously, and address it visibly and promptly. When workers' concerns are ignored, or if management retaliates, workers quickly lose trust in the system and are discouraged from reporting potential hazards in the future. Establishing a formalized process to respond to safety concerns and to conduct blame-free investigations of close calls and incidents reflects strong commitment to safety. Management should review all serious incident reports, determine contributing factors, and communicate findings to foreign workers to prevent recurrences.

5.2.2 Safety Training with Safety Compliance and Safety Participation

With regard to the hypothesis, there will be a significant relationship between safety training with safety compliance and safety participation. Results from the analysis revealed a significant relationship between safety training with safety compliance and safety participation among workers in the steel fabrication construction company. The significant relationship exist due to, first, the management need to give the highest level of priority to safety training convincing the employees about the need for safety compliance (Fernandez-Muniz et al., 2007; Griffin and Neal, 2000; Vredenburgh, 2002 and Zohar, 1980)and safety participation. Safety trainings programs in the steel fabrication construction company were developed based on past experiences and advice from the safety and health committee members which comprises representatives from management and workers. Griffin and Neal (2000) commented that each employee treats training differently. The employees will be supportive only when they take ownership of the training program. When the employees are positive, it is more likely that they will be

supportive about the changes introduced by the program. Employees may not be interested in the safety programs if the management does not involve them at the development stage of safety programs.

Second, there are regular safety and health trainings conducted at workgroup level. Edwards et al. (2009) conducted a study on a multinational, high technology firm that produces various computer parts and also accessories called Westec. The findings revealed that there were a lot of discussions in workgroup meetings on weekly basis about safety and health. The employees regard safety and health is highly valued in their organization when their top management provides extensive safety and health training.

Third, safety training designed to impart good knowledge about the various processes, associated hazards and the safety measures to be taken by the employees in case of emergencies (Stellman, 1998). Such safety training programmes conducted regularly and the compliance made compulsory. Each worker shall be given an opportunity to participate in the training programs organized by the management. Therefore when employees are given chances and appropriate safety and health training, they might feel that the organization cares about their safety and health well-being. Thus, they attempted to work more safely in the organization as indicated by Sinclair et al. (2003). More specifically, for example, when employees received appropriate safety training, they would engage in better safety behaviour such as compliance to safety work procedures, accident reporting procedures, emergency response and personal protective equipment (PPE). Besides that, in order to motivate the employees, they are given opportunities to present case studies and must actively participate in discussions (Vinod Kumar and

Bhasi, 2010). Regular evaluation of safety knowledge, level of safety motivation and safety skills are made an integral part of safety training programmes in this organisation.

Finally, the finding from this study is also similar with the previous study conducted by Burke (2006) that the effectiveness of safety training increases the knowledge and significantly reducing unwanted incident among employees. Most of the training in this organisation are conducted in English or Malay language which easily understood by employees especially the foreign workers.

5.2.3 Workers' Involvement with Safety Compliance and Safety Participation

In the current study, it was hypothesized that there will be a significant relationship between workers' involvement with safety compliance and safety participation. Previous studies show that employees' participation is an important factor for safety compliance and participation (Biggs et al., 2005; Gevers, 1983; O'Toole, 1999; Khairiah, 2008; Vredenburgh, 2002). However, in this study, workers' involvement is not significantly related to safety compliance and safety participation.

This is probably due to the main decision on formulation of safety policies, rules and procedures are decided by the top management (senior staffs and supervisors) rather than involvement of the foreign workers. This practice is very close to the observation made by Blair and Geller (2000) that traditionally, the employer is responsible for accident prevention at workplace and it is the duty of the employer to establish the rules and procedures and also make changes and decisions. The decisions on the aspect of safety and health should not be undertaken by experts or the top management alone

(Johnstone et al., 2005). In theory, the most qualified person who can make safety improvement at work is the employee himself as he is the one who is closest to the work (Vredenburgh, 1998). Wharton (2003) also commented that the safety performance is higher and increases when the employees are allowed to be a part of the decision-making process. Therefore, workers' involvement is an important factor for safety compliance and safety participation that must be allowed in the decision making process through safety and health committee established in the organisation.

Furthermore, in this organisation the main language used to communicate with workers are Malay language and English language. The safety messages are easily understood by local workers compared to foreign workers. The language barrier among foreign workers restricted them from immediately report any accidents or mishaps in the workplace. This will also discourage the foreign workers involvement in the safety and health activities in the organisation for example safety briefings or tool box session, safety and health induction and training programs.

5.2.4 Safety Communication and Feedback with Safety Compliance and Safety Participation

It was hypothesized that there will be a significant relationship between safety communication and feedback with safety compliance and safety participation in this study. Previous empirical study indicated that efficient safety communication and feedback helps management track errors at work and correct deviations effectively (Eshraghi & Salehi, 2010; Pandey & Garnett, 2006). Therefore, the findings show that

safety communication and feedback has no significant relationship on safety compliance and safety participation.

This is due to, in this organization, safety and health information are only channeled down to the foreign workers through their respective head of departments, supervisors and team leaders after the safety and health issues are discussed in the Safety and Health Committee which is conducted every three months once. Other safety communications such as regular meetings, notice boards, newsletters, poster, pamphlets and discussion on safety compliance and safety participation are not carried out on a regular basis. Vinodkumar & Bhasi (2010) reported that a good way to improve the safety performance at workplace is through regular communication between management and employees.

Besides that, in this organisation there are several hinder effective safety communication and feedback such as one-off nature of the construction process and inherent uncertainty, reliance on transitory sub-contractors, centralized organisation and adversarial culture. Therefore, the management should focus on open and honest communication with managers having confident in employees' ideas and suggestion.

Other than that, the workers involvement especially foreign workers in the development of training programme and work group discussions are not effective for development of training programmes. The workers foreign workers must be involved in the decision making and regular feedback on safety performance is needed for good safety compliance. Therefore, safety communication and feedback must be carried out on

regular basis between management, supervisors and workers as indicated Vinodkumar & Bhasi, 2010.

5.2.5 Safety Rules and Procedures with Safety Compliance and Safety Participation

This study revealed that safety rules and procedures have significant relationship on safety compliance and safety participation as hypothesized earlier. This is probably because the workers feel that if adequate safety rules and procedures are in place then it will give a better chance or possibility to achieve good safety behaviour (safety participation and safety compliance) (Dilda et al. 2009). He added that documented safety rules and procedures in the form of method statement, job safety analysis (JSA) and accident reporting and investigations are important to achieve good safety and health behaviour in construction industries. Besides that, other studies have also revealed that safety rules and procedures are important for the safety compliance and safety participation (Cox and Cheyne, 2000; Glendon and Litherland, 2001 and Mearns et al., 2003).

In this organisation, workers tend to follow safety rules and procedures because they are consistently rewarded (e.g. monetary and non-monetary) by the management for safety best practices that has been implemented by the organisation.

In addition, any changes on the safety rules and procedures in the organisation will be communicated immediately to workers during the safety and health briefings or tool box session in order to update and create awareness among workers especially foreign

workers. The behaviour of the employee is not confined to complying with the organization's regulations and procedures but when they understand their individual role and contribution in the promotion of safety and health clearly. In other words, the employee participates in the creation of safety rules and procedures for the job as supported by Glendon & Litherland (2001).

5.2.6 Safety Promotion Policies with Safety Compliance and Safety Participation

In the present study, it was hypothesized that there will be a significant relationship between safety promotion policies with safety compliance and safety participation. The findings of this study show that safety promotion policies do not have significant relationship on safety compliance. In contrary, previous studies found that safety promotion policies (Dejoy et al., 2010; Forrester et al., 1996 and Geldart et al., 2010) are an important factor for safety compliance.

This is due to in this organisation, even though, a lot of safety promotional programs such as accident investigation, safety training and communications, first aid and medical care, periodic internal inspection and accident record keeping are conducted, yet difficult to cultivate a safety compliance among foreign workers due to language barriers. This could resulted to the management to promote safety and health programs effectively which can put an end to the organization to create a safer way of operations and therefore, results in an unsafe working environment and increases the number of mishaps (Abdelhamid and Everett, 2000).

In this organisation, safety promotion policies is not incorporated with the management programmes namely safety training, safety communication, safety rules and procedures, workers' involvement in safety, top management's commitment and others. This resulted the workers to be ignorance towards safety compliance.

However, the findings of this study also show significant relationship between safety promotion policies and safety participation among workers in the steel fabrication construction company.

In this organization, the management develop committed employees through effective implementation of safety promotional policies. These employees become a strong foundation. The safety promotional activities should consistently demonstrate the management's commitment to the employees' safety and health in order to enhance safety at workplace. When a strong foundation is achieved, the management easily implement specific workplace safety initiatives through workers participation readily without any objections or hesitations (Dejoy et al., 2010).

Currently, this organisation practicing proactive safety programmes that are effective to create a safe working environment for the employees and help the management to come up with safer means of operations. This encourage workers to actively participate in safety and health programmes initiated by organisation.

5.3 Implications

In this section, the implications resulting from the outcome on both theoretical and practical will be focused.

5.3.1 Theoretical Implications

This study was done to investigate the influence of safety management practices with safety behaviour (safety compliance and safety participation) among employees in steel fabrication construction company. There are many similar studies was done in various industries such as in utility industry, telecommunication industry, hospital industry, and even in government agencies (Szer, 2012). There have been lots of similar study were conducted to prove that the safety management practices has influenced in safety behaviour (safety compliance and safety participation). Therefore, this study was extended to steel fabrication construction company to measure the reliability of the six safety management practices variables such as management commitment, safety training, workers' involvement, safety communication and feedback, safety rules and procedures, and safety promotion policies which influence on the study academically. Besides, this study was conducted among foreign workers in the steel fabrication construction company where it creates new opportunity for researches in the non-western to prove on the influences of safety management practices with safety compliance and safety participation. This study would be worthy and contributes value to the academic world due to lack of study were conducted among steel fabrication construction company employees in Malaysia.

Theoretically, the findings of this study pointed out that the steel fabrication construction company management should emphasis on management communication, safety training, safety rules and procedures and safety promotion policies in order to cultivate the safety compliance and safety participation among employees. The present study also makes contribution by emphasizing that safety management practices and safety behaviour relationship can be understand if the safety compliance and safety participation are examined simultaneously in a study.

This study also help the researchers to know about the safety management practices that influence the safety behaviour (safety compliance and safety participation) among foreign workers in the steel fabrication construction industry. Therefore, the findings also could help the researchers to further improve on safety and health management among foreign employees and safe guard them.

5.3.2 Practical Implications

Safety behaviour (safety compliance and safety participation) is an important factor as it should be practiced in the organization. Therefore, managers are expected to continuously encourage safety compliance and safety participation among employees. This study proposes several suggestions based on the findings which highlight the importance of safety management practices in encouraging safety behaviour (safety compliance and safety participation).

The findings of this study show that the antecedents of safety behaviour (safety compliance and safety participation) are management commitment, safety training, safety rules and procedures and, safety promotion and policies. Thus, in attempt to increase safety compliance and safety participation among employees, managers need to encourage these four variables.

The first variable is management commitment. The findings from the present study showed that management commitment predicts safety compliance. A lesson for managers from the finding is to encourage safety compliance. Managers should focus not only management commitment but also how to comply with safety. Among the strategies that can be employed by managers in enhancing safety compliance through management commitment is by emphasizing the importance of workplace safety and health through written policies. It will help the workers to work in a safe and healthy environment. Managers also could take action by creating, evaluating and improving the written policies on safety and health from time to time. Next, the top management team must commit the resources (e.g. time, money and personnel) needed to protect the workers. Managers should explain clearly and objectively what the organization is able to provide employees in regard to safety and health and, also what will be expected from them. Lastly, managers need to immediately respond to all the reports of unsafe, unhealthy conditions and work practices. If injuries or illnesses occur, the managers should go beyond the regulations and address all hazards with appropriate resolutions.

The second variable is safety training. Empirical research has provided evidence safety training as predictors of safety compliance and safety participation. Therefore, managers should ensure different types of safety training (e.g. understanding of Malaysia legal requirement on occupational safety and health at workplace, accident reporting and investigating procedures and emergency responses) are well implemented in order to encourage safety behaviour (safety compliance and safety participation) among employees.

Safety and health is everyone's responsibility and employees have a stake in the success of the training. Implementing safety training can be realized either by bettering the system or the skills of managers who handle aspects of training. Managers should establish an active safety and health committee with daily inspections. This is to ensure that the safety training are clear, not ambiguous, and are executed consistently without personal bias. Next, managers are also responsible in keeping the employees informed about safety inspections, injury and illness statistics. Besides that, employees input and feedback should also take into account because they know more about safety problems and solutions than manager do. This will helps in improving the safety training in future.

The third variable is safety rules and procedures. The findings of present study provided evidence that safety rules and procedures are significantly related to safety compliance and safety participation. Therefore, managers should ensure safety rules and procedures are well executed to increase safety behaviour (safety compliance and safety

participation) among foreign workers. The managers can implement some measures during the recruitment process in order to encourage safety compliance and safety participation among workers through safety rules and procedures. For example, during recruitment process, managers or the organization's agent can provide realistic preview of safety rules and procedures to expose the candidates to both the positive and negative aspects of safety and health in the organization. Thus, by providing a realistic preview of safety rules and procedures, workers will develop the perception of their responsibility to the organization in terms of safety and health. More specifically, realistic preview of safety rules and procedures will influence workers in developing their expectation of how managers or organizations should treat them. Such expectations would help to encourage safety compliance and participation.

The last variable is safety promotion and policies which the finding showed are significantly related to safety participation. Therefore, managers could encourage workers safety participation by providing effective safety promotion and policies. This could be in the form of morning exercises, tool box discussion, accident investigation, safety training and communications, first aid and medical care and periodic internal inspection so as to increase safety participation in the organization.

5.4 Limitations and Suggestions for Future Research

There were few limitations the researcher stumbled upon in the data collection process. The first limitation of this study is the employment of cross-sectional research design. Cross-sectional data usually collected at a given point in time (Hair et al. 2007). During

data collection, some respondents responded that the questionnaires were lengthy and time consuming. This is definitely due to the nature of the respondents' job, where time is critical factor in their work routine. Therefore, to overcome this limitation in future research, researcher could consider longitudinal research to improve the findings (Bryman & Bell, 2011).

The second limitation is concerned with language barrier. Even though the questionnaires in the present study was prepared in dual languages (e.g. Malay language and English language), some respondents were still unable to read and understand the questions. For the purpose of this study, the researcher explained the questions in detail until the foreign workers able to answer the questionnaires. Thus, to reduce this limitation in future research, the researcher can consider other languages based on the respondents origin when preparing the questionnaires.

The third limitation is related to the assessment of variables based on the self-report. The self-reporting regarding sensitive issues or the variables could lead towards common method variance. In the present study, the variables that relate to sensitive issues are management commitment, safety training, safety promotion and policies, safety rules and procedures and safety behaviour (e.g. safety compliance, safety participation). Respondents might feel that their answers could lead towards negative implications and this would lead them to answer the question based on social expectation. Therefore, to minimize this issue, a *post hoc* Harman one factor analysis using exploratory factor

analysis (EFA) was conducted to identify whether or not any single constructs accounts for the majority of the explained variance. The main purpose of this analysis is to detect the presence of common method variance (Podsakoff & Organ 1986; Podsakoff et. al. 2003). Therefore, based on the results, the largest variance explained by the first factor was 22 percent (please refer to Appendix B) which revealed that the common method variance is not an issue in these data. Thus, to overcome this limitation in future research, the researcher can consider peer-report or supervisor-report to assess safety management practices and safety behaviour (e.g. safety compliance and safety participation).

In addition to highlighting the limitations and providing suggestions to deal with the limitations, the findings from the study also offer some avenue for future research. First, it would be worthwhile to consider cultural issues that would help us to understand better the safety behaviour (safety compliance and safety participation). An examination on how individual cultural value orientation moderates the relationship between safety management practices and safety behaviour (safety compliance and safety participation) could be performed to add more value to existing theory building.

Finally, the level of safety management practices and safety behaviour (safety compliance and safety participation) may be varying according to the specific sectors. As the present study focused on construction industry, there may be some skepticism in terms of generalizability. In light of this, future research may focus on manufacturing

industries as they seem to share the same set of homogenous characteristics to a large extent. Specifically, highly technical work environment is among the similar characteristics found in construction industry.

5.5 Conclusions

The result of this study demonstrated the validity and reliability of six facets of safety management practices on safety compliance and safety participation among local and foreign workers in the construction industry. Direct effects of safety management practices on components of safety behaviour (safety compliance and safety participation) were also identified. The results of this study highlighted the management commitment, safety training, workers' involvement, safety communication and feedback, safety rules and procedures and safety promotion policies were important factors to local and foreign workers to minimize the accident rate in the industry. It is believed that, this study would be beneficial to all relevant parties involved in the educational sector, ranging from those involved in academic research, students, end-users, as well as the various practitioners in safety behaviour management identifying the mechanisms by which can improve safety at workplace.

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